

HOW TO... Make Spirograph effects

It's easy to recreate the intricate effects of a Spirograph on your computer with Serif DrawPlus 4. Adam Banks shows you the fun you can have just going round in circles

You've probably played with a Spirograph in the past, a set of plastic cogs designed to be rolled around each other with a pencil or pen to create impressive repeating patterns. You can mimic the technique using freeware and shareware that generate the patterns, known as epicycloids. Try Epicycles for Windows, which is downloadable from www.epicycles.com.

Alternatively, you can create your own cyclical patterns using general-purpose graphics software. True epicycles are too ambitious for the built-in maths functions usually provided, but you can get similar effects using the repeated transformation or step-and-repeat features of vector drawing software. If you don't have a drawing program such as CorelDraw, use Serif DrawPlus 4, an ancient but effective program available free at www.freerisefsoftware.com.

The basic principle of epicycles is that your pencil rotates around a circle, which is itself rotating around a second circle. You can't do the exact same thing with drawing software, but you can draw a circle or oval and make copies of it that are moved or 'offset' by a certain distance, thus producing a long line of repeated ovals. Things get more interesting when you also opt to rotate each copy.

In changing the orientation of each copy, this also changes the direction of the offset. The result is that the copies rotate around an imaginary circle. Make the right number of copies and the circle will be completed, creating an attractive symmetrical pattern.

1 Run DrawPlus 4 and click Create a Drawing, then click Next. Leave the page size set to A4 Wide and click Finish. A new blank page appears. Click the QuickShape tool icon, fifth from the top in the main tool palette down the left-hand side, to pop out a set of shape options. Choose QuickEllipse (the plain circle icon), then click near the bottom left of the page and drag to draw an oval.

2 By default, shapes are filled with solid black. In the Fill tab on the right of the screen, click the pop-up menu at the top, which shows Solid, and choose None. Go to the Line tab and change the first pop-up menu option from None to a narrow width such as 0.5p (half a point, about 0.175mm).

3 Drawing programs each have their own way of performing repeated transformations. In DrawPlus, you use the Transform Wizard. First make sure your oval is still selected, indicated by black handles on its sides and corners; if not, click on it to reselect it. Then go to the Tools menu and choose Transform Wizard. In the first step of the Wizard, select No

to choose a custom transform and click Next. You're asked which transformations to apply. Set a small rotation, 2.00 degrees in this example, and leave the scale at 100%. Using a scaling factor would create patterns spiralling inwards or outwards rather than revolving symmetrically.

4 Click Next and select Yes to make a number of successive copies. To work out the right number of copies, divide 360 (the number of degrees in a full circle) by the rotation factor you entered previously and subtract one for the original shape. So $360 \div 2 = 179$. Enter this number in the box and click Next again. Finally, you're asked how far to offset each copy of your shape. You'll get more interesting effects if the X and Y offsets are different. Make the distances quite small, or the copied shapes will disappear off the edges of the page. In this example, the X (horizontal) offset is set to 0.2cm and Y (vertical) to 0.1cm. Click Next then Finish.

5 If you've used the values shown, you'll get a similar pattern. You can produce endless variations by changing the settings and drawing different shapes to start with. A straight line can work, too, as can some of the more complex QuickShapes. You can also change the colour and thickness of the original shape's outline.

6 For more creative effects, use the gradient fills in the Fill tab to give your original shape a multi-coloured tint. Increase the Level slider in the Transparency tab to make it see-through. Repeat this with the Transform Wizard for remarkable results. This example used the Splat QuickShape with Conical Fill 70 and 60% Transparency. The Transform settings were: 12 degrees, 29 copies, X offset 1cm, Y offset 0.5cm. Notice the glitch where the final copy overlaps the first. You can't get rid of this, but you can use the transparency settings to minimise it. 

EXPERT TIP

Save your finished artwork as a JPEG using the Export command. Reduce the JPEG resolution for small web graphics or increase it for high-quality printing.

